



# Update on EPA Activities and Connections with HEI



**HEI Sponsors' Meeting**  
Boston, MA  
March 4, 2019

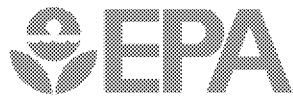
- Continued success of the HEI Partnership
- FY19-FY22 Strategic Research Action Plan
- Ongoing Mobile Source Activities
- NAAQS Review Schedule
- Support for HEI Energy



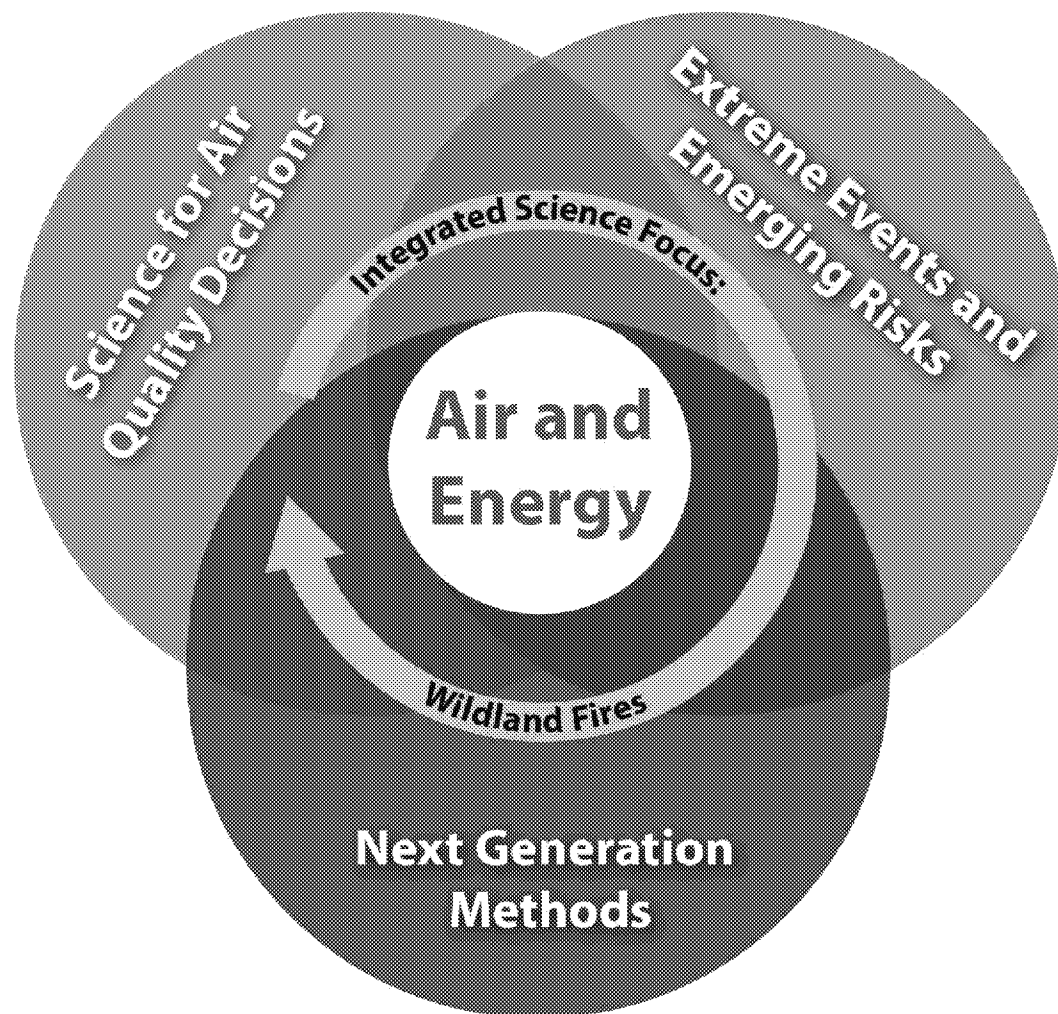
# HEI: A Valued Partnership

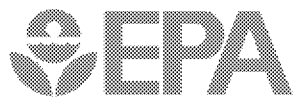
- As a unique, non-profit organization, HEI serves as a model public-private partnership
- HEI continues to provide impartial science that is high quality, timely, targeted, and useful
- HEI plays an important role in:
  - Fostering innovative research on important issues
  - Synthesizing, evaluating, and translating critical bodies of scientific literature
  - Promoting learning opportunities and supporting young investigators





# FY19-FY22 Strategic Research Action Plan





# Topics and Research Areas

| Topic   | Research Areas   |   |
|---|--|---|
| <b>Science for Air Quality Decisions</b>                                    | #1: Approaches to support air quality management programs for multiple pollutants at multiple scales | #9: Wildland Fires (Integrated Science Focus) |
|   | #2: Approaches for characterizing source emissions, air quality, exposure, and mitigation strategies |   |
|   | #3: Public health and environmental responses to air pollution                                       |   |
| <b>Extreme Events and Emerging Risks</b>                                    | #4: Public health and ecosystem exposures and responses to emerging air pollutants and sources       |   |
|   | #5: Methods to evaluate environmental benefits and consequences of changing energy systems           |   |
|   | #6: Methods to enable resilience to future environmental stressors                                   |   |
| <b>Next Generation Methods to Improve Public Health and the Environment</b> | #7: Emerging approaches to improve air quality and exposure characterization                         |   |
|   | #8: Novel approaches to assess human health and ecosystem impacts and risks                          |   |



## Topic 1: Science for Air Quality Decisions (1 of 2)

- **RA 1: Approaches to support air quality management programs for multiple pollutants at multiple scales**
  - Develop and evaluate methods and models to support air quality management programs
    - Conduct research to advance understanding of atmospheric science and incorporate into periodic updates to CMAQ and dispersion models (AERMOD)
    - Advance approaches to estimate background contributions of PM and O<sub>3</sub>
- **RA 2: Approaches for characterizing source emissions, air quality, exposure, and mitigation strategies**
  - Develop, evaluate, and apply improved measurement methods
    - **Criteria pollutants** - Designations and methods development for Federal Reference Methods (FEMs) and Federal Equivalent Methods (FEMs)
    - **Hazardous air pollutants (HAPs)** – methods development, including fenceline measurements to identify and characterize previously undetected leaks from sources
  - Provide tools for state/tribal/local stakeholders' use to identify and evaluate effective emissions reduction strategies

*Examples of research in each Research Area (RA) are reflective of the nature of envisioned research and do not constitute the full scope of the RA*



## Topic 1: Science for Air Quality Decisions (1 of 2)

- **RA 3: Public health and environmental responses to air pollution**
  - Improve understanding of local and regional characteristics influencing impacts on public health in healthy and at-risk populations
  - Expand understanding of impacts at lower ambient concentrations
  - Enhance knowledge of the potential health impacts of multi-day pollution events (such as wildfires) in relationship to single-day events and longer-term exposures
  - Improve characterization of the relationships between ambient concentrations, deposition, and ecosystem impacts
  - Inform effective and consistent public health messages for actions to reduce risks and public health impacts

*Examples of research in each Research Area (RA) are reflective of the nature of envisioned research and do not constitute the full scope of the RA*



## Topic 2: Extreme Events and Emerging Risks

### ***How we respond to changes in environmental conditions and issues***

- RA4 focuses on “new” pollutants and sources – those whose risks were unknown/unclear or that were not previously of concern
  - PFAS, ethylene oxide as examples: determine sources, measurement and quantification methods, control approaches
- RA5 examines large-scale changes in the energy system and the potential challenges and benefits to the environment
  - Potential advances in energy technologies, growth and evolution of energy production and use, and associated environmental consequences
- RA6 investigates how changes in the atmosphere – extreme events, mean precipitation and temperature – can affect EPA’s ability to fulfill its mission
  - Impacts of increasing temperatures and extreme events (including wildland fire) on air quality, water quality and treatment, aquatic ecosystems; and ultimately on health

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### RA 7: Measurement and modeling

#### New Sensor Technologies for Air Quality Monitoring:

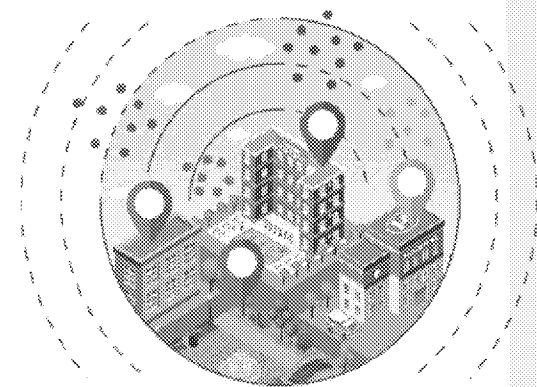
- Provide more real time, very localized data; performance varies widely, affects advisories
  - Evaluations in the lab, in the field, wide range of conditions across US (short & longer term)
  - Development of performance targets and tools for data analysis

#### Modeling and Measurement Fusion

- Combines data from all monitoring instruments and satellites to represent ambient air pollution

#### New Air Quality Model Development

- More efficient, multiple pollutant; multiple scales; will link with new global meteorological models



*Examples of research in each Research Area (RA) are reflective of the nature of envisioned research and do not constitute the full scope of the RA*



## Topic 3

### Next Generation Methods (2 of 2)

#### **RA-8: Novel approaches to assess health and ecological risks**

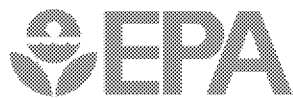
##### **New Directions in Health Care and Understanding of Air Pollution Risks**

- HHS Million Hearts Initiative now advising high risk patients to avoid PM<sub>2.5</sub>. This opens doors with medical community and new research partners (e.g, NHLBI)
- Developments in individualized medicine, health analytics and technology fosters new health research approaches using
  - Using electronic health data systems for epidemiology
  - Combining air quality sensor and individual health data

##### **Integration of Ecosystem and Forest Service Models to Assess Impacts of Fires**

- Enables environmental managers to identify vulnerable areas; including impacts to ground and surface water quality and overall ecosystem-health challenges

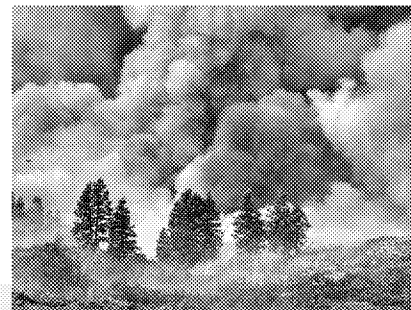
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# Integrated Science Focus: Wildland Fires

## *An Issue of Increasing National Concern*

- Wildland fires are increasing in frequency, size, and intensity in the US
- 2014 National Emissions Inventory estimates that, on average, >30% of PM<sub>2.5</sub> is associated with emissions from wildland fires
- Cutting across and drawing from the 3 Research Topics an integrated science focus on wildland fires will explore:
  - What ecosystems and human populations are vulnerable to wildland fires?
  - What approaches can be used to mitigate risks to human health and ecosystems?
  - How and to whom do we communicate these approaches/guidance to reduce risks?





# Cleaner Trucks Initiative

**Announced in November 2018, objective is to reduce emissions from new heavy-duty trucks and engines**

- Aiming for proposal in 2020

## **Lower NOx emissions nationwide**

- Pursue a national, harmonized program
- California already working on a low NOx program



## **Ensure emissions reductions in the real world**

- Current standards have not encouraged effective emission control during idle, stop-and-go traffic, slow speeds

## **Modernize requirements to better reflect capability of available emissions control technologies**

- EPA last revised NOx standards for heavy-duty trucks nearly 20 years ago
- Including opportunities to streamline requirements



# Other Mobile Source Activities

## **Other regulatory programs:**

- Light-duty vehicles, renewable fuels, aircraft, marine

## **Ongoing partnership programs:**

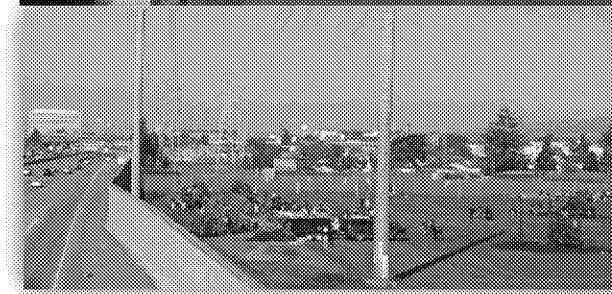
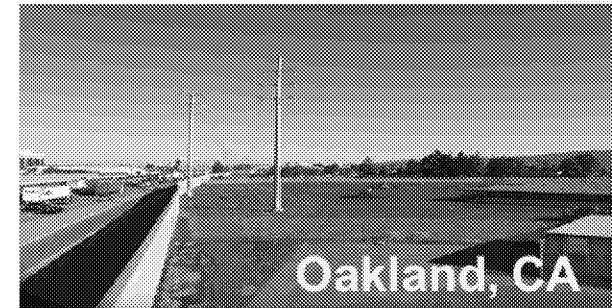
- EPA Ports Initiative
- DERA Clean Diesel Grant funding
- SmartWay Transport Partnership

## **Ongoing evaluations of air quality impacts of engines and fuels**

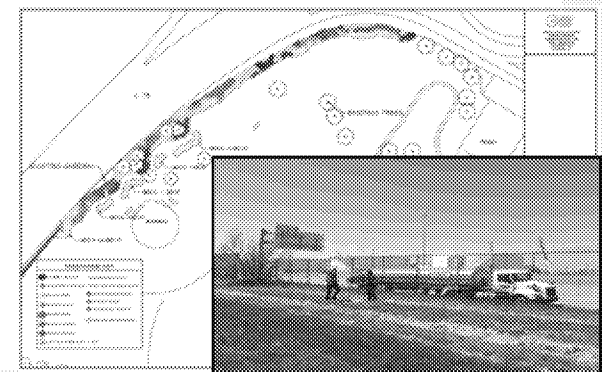


# Near-Road Air Quality

- PM hot-spot analyses under transportation conformity
- Near-road monitoring network ( $\text{NO}_2$ ,  $\text{PM}_{2.5}$ , CO)
- Improving local-scale modeling near roads
  - Including solid and vegetative barriers
- Pilot studies on roadside vegetation for air quality and other benefits, measuring before and after planting (Oakland, CA and Detroit, MI)
- **HEI Activities of High Interest:**
  - Expert panel reviewing near-roadway health studies
  - Long-term health studies examining near-road air quality, noise, SES, green space
  - Near-road exposure studies



**Detroit, MI**





# NAAQS Reviews: Status Update and Next Steps

## Ongoing Reviews

- **PM**

- ❖ Fall 2018: Draft ISA released (October); CASAC meeting (December)
- ❖ March 2019: CASAC teleconference to discuss letter on draft ISA
- ❖ Early 2020: Proposal
- ❖ Late 2020: Final

- **Ozone**

- ❖ Summer 2019: Anticipated release of draft ISA
- ❖ Early/Mid 2020: Proposal
- ❖ Late 2020: Final

- **NO<sub>x</sub>/SO<sub>x</sub>/PM Ecological Effects**

- ❖ Next Steps are to release a final ISA and a draft REA/PA – Timing will be influenced by final PM and ozone schedules

## Recently Completed Reviews

- **NO<sub>2</sub> Primary:** Final notice retaining existing standards signed April 6, 2018
- **SO<sub>2</sub> Primary:** Final notice retaining existing standards signed February 25, 2019



## EPA Support for HEI Energy

- Congress directed EPA to fund a partnership to “provide credible science, of national scope, relating to unconventional oil and gas development.”
  - FY18: not less than \$1M
  - FY19: up to \$3M
- September 7, 2018: EPA published a notice of intent to negotiate a sole source contract with HEI to contribute to such a partnership
- February 13, 2019: EPA issued a solicitation for a proposal from HEI
- **EPA hopes to award a 5-year contract to HEI in April**



# Thank You to HEI and our Co-Sponsors

For continuing to provide research and analyses that benefit human health, the environment, and policy





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# Continuing Extramural Research

- ORD extramural grants complement our intramural research portfolio
- Grants currently ongoing were funded under the following solicitations:
  - Measurements and Modeling for Quantifying Air Quality and Climatic Impacts of Residential Biomass or Coal Combustion for Cooking, Heating, and Lighting (2014-2019)
  - Indoor Air and Climate Change (2014-2019)
  - Particulate Matter and Related Pollutants in a Changing World (2016-2021)
  - Air Pollution Monitoring for Communities Grants (2016-2021)
  - Air, Climate, and Energy (ACE) Centers (2016-2020)
  - Long-term Exposure to Air Pollution and Development of Cardiovascular Disease (2017 – 2021)